Examining students' use of, preferences for, and learning with e-textbooks

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Abstract

E-textbooks (e-texts) are becoming more available in higher education as they offer a cost advantage and features that are intended to enhance teaching and learning. Although previous studies speak to student experiences and preferences for e-texts, these studies are often limited in scope. The purpose of this study is to understand student experiences with e-texts and the factors that drive their preferences for textbook medium with a large-scale multi-institution data set. Findings indicate that e-text use and preferences differ by a variety of student characteristics, most notably students' class level and major field. In general, students who more frequently used the interactive features of e-texts felt that their use of these tools contributed to their learning and interactions with others.

Keywords: e-textbook, higher education, NSSE, engagement.

Digital devices have become part of our everyday lives, at home, at work, and at school. The amount of reading on digital devices has substantially increased in the last decade. As an example of technology integration in education, e-textbooks are becoming more available in higher education as they offer cost advantage and features that are intended to enhance teaching and learning. Adoption of e-textbooks in US higher education institutions have been mostly driven by student choice although some universities have developed university-wide programs that are instructor-driven and lead to wider adoption of this technology. Previous studies speak to student experience and preferences in particular universities (Abaci, Morrone, & Dennis, 2015; deNoyelles, Raible, & Seilhamer, 2015; deNoyelles & Raible, 2017; Ji, Michaels, & Waterman, 2014). These studies suggest that students in higher education are mainly driven by lower cost and convenience to purchase/prefer e-textbooks, while interactive features that are intended for enhanced learning are not considered as key reasons for adoption. However, these studies are limited to single institutions. There is a need to examine student perceptions and preferences from multiple institutions for better generalization.

As a tool and resource for improving student interaction and commitment towards educational materials, this study naturally lends itself towards a discussion of student engagement. Student engagement represents a construct that operates across multiple facets and levels. Various frameworks have identified student engagement as involving their investment of time and resources (Tinto, 1975), participation in practices and activities (Kuh, Kinzie, Buckley, Brides, & Hayek, 2007), or effortful involvement in learning activities (Astin, 1984). Engagement has also been elaborated as an aggregated construct involving motivational, cognitive, emotional, and behavioral components (Fredricks, Blumenfield, Paris, & Schoo, 2004; Reschly & Christensen, 2012). Additionally, engagement also involves institutional commitments and affordances to and of resources and systems with which students interact (Kuh, 2003; 2006). As such, engagement represents a variously understood and conceptualized construct that does not afford a one size fits all measure or metric. This conceptual vagueness is

particularly the case for engagement with technology mediated learning environments, which represents a relatively nascent variation of the engagement construct (Henrie, Halverson, & Graham, 2015). Consequently, further understanding and development of measures and metrics of engagement within technology mediated learning environments is warranted.

The growth in institutional adoption and maintenance of e-textbook systems allows analysis of wider slices of learner preferences and interaction with these systems through data generated from electronic textbooks in addition to patterns that contribute and constrain adoption of e-textbooks as tools for their learning. As such, understanding engagement within these technologies enables insight into what and how engagement with a particular type of digital learning tool occurs. As with many tools and systems, engagement with reading materials and early access to reading materials via e-textbooks correlates to more positive performance for students (Van Horne, Russel, & Schuh, 2016; Junco & Clem, 2015; Daniel & Woody, 2013). These studies, however, have noted limited adoption or interaction with e-text materials and are limited to smaller institutional scales. This indicates a need for understanding the degree and type of interactions with these resources across institutions. Consequently, this gap orients the current study with the NSSE framework and tool.

The National Survey of Student Engagement (NSSE) was developed nearly 20 years ago to gather information about collegiate quality on a national level using a survey of good practices in undergraduate education. NSSE doesn't assess student learning directly, but survey results point to areas where colleges and universities are performing well and what aspects of the student experience could be improved (Kuh, 2009). Rooted in the higher education traditions of time on task, quality of effort, and involvement, NSSE focuses on student engagement as the educationally beneficial behaviors and activities students take part in as well as the supports and resources provided by institutions for their development (NSSE, 2018b). Given this understanding of student engagement, questions naturally arise on the involvement and structuring of e-text resources for students at an individual and

institutional level. Specifically, questions regarding students' perceptions and experiences with e-textbooks enable understanding and identification of trends in students' engagement with digital learning tools.

The purpose of this study is therefore to understand student experience with e-textbooks in higher education and factors that drive their preference for textbook medium. In particular, the researchers seek to answer the following research questions:

1. How does e-textbook use vary by student demographics and institution characteristics?
2. How are students' preferences for textbook features related to e-textbook use?
3. How does students' learning with e-textbooks relate to the use of various interactive features?

Methods

Data

The data from this study come from the 2018 administration of the National Survey of Student Engagement (NSSE). NSSE annually collects information from hundreds of four-year colleges and universities about first-year and senior students' participation in programs that institutions provide for their learning and development. NSSE was designed to measure the time and effort that students invest in activities shown to be related to student positive learning outcomes. NSSE 2018 was administered at 511 institutions across the United States and Canada resulting in responses from 289,867 students. A subset of 34 participating NSSE institutions received an additional item set asking students about their use and perceptions of e-textbooks. This study focuses on the responses of over 10,300 students who responded to items in this additional set (see Table 1 for the e-textbook question set).

Respondents

Of the 10,351 students in this study, around two in five (42%) were first-year students. Overall, around one-third of students (35%) used e-textbooks in two or more of their classes, with around a

quarter (26%) using an e-textbook in one course, and two in five (39%) not using any e-textbooks in their courses. Of the students that didn't use an e-textbook, a little over half (54%) reported this was because they preferred a print textbook. One in five students (20%) did not have a course that required a textbook, and a quarter (26%) had a textbook but it wasn't available as an e-textbook. Two-thirds of students (64%) preferred using a print textbook with one in five (20%) preferring an e-textbook and the remaining (16%) having no preference. For additional respondent demographics and student characteristics see Table 2.

Students in this study were enrolled in a wide variety of institution types. Around two in five (43%) of students were enrolled at master's-granting institutions with larger programs with smaller proportions enrolled in doctoral-granting institutions with highest research activity (16%), baccalaureate-granting institutions with diverse fields (13%), and baccalaureate-granting institutions with arts and sciences focus (12%). Fewer than one in ten students were enrolled at master's-granting institutions with medium programs (7%), doctoral-granting institutions with higher research activity (6%), and master's-granting institutions with smaller programs (4%). Two-thirds of students (66%) were enrolled at a publicly controlled institution. Around one-quarter of students (27%) were enrolled at small institutions (fewer than 2,500 enrolled undergraduates), about a third (34%) were enrolled at medium or large institutions (2,500-9,999 enrollments), and the remaining two in five (39%) were enrolled at very large institutions (10,000 or more enrollments). Around half of the students (53%) were enrolled at institutions in the Southeast region of the United States with smaller proportions in the Southwest (13%) and mid-East (11%). Fewer than one in ten students were enrolled in institutions located in the plains regions of the United States (8%), Rocky Mountains (6%), Great Lakes (5%), New England (4%), and far West (< 1%).

Measures

To be included in this study, students had to respond to at least one of the questions in the e-textbook item set although only a subset of the items are the focus of this study. A key variable used in this study is students' report of in how many of their classes they used an electronic textbook (none, one, or two or more courses). We additionally examined results from items asking students what aspects are important to them in their preferred textbook format (cost, keyword search, offline access, etc.) and whether students prefer a print textbook, e-textbook, or do not have a preference. To measure students' perceptions of learning with e-textbooks, three items were combined to create a scale, *E-Text Learning* ($\alpha = .78$). The component items in this scale asked students how much e-textbooks have contributed to their understanding of course material, studying or completing coursework on their own, and studying or completing coursework with other students. We additionally examined students' frequency of use of features such as keyword search, bookmarking, highlighting, interacting with other students, and sending the instructor a question. A variety of student demographic and characteristic data were additionally used from the core NSSE survey.

Analyses

To answer our first research question about how student e-textbook use varies by student and institution characteristics, we used χ^2 (chi-square) tests to examine the representation of students by e-textbook use. Adjusted residuals greater than |2| were considered to be notable (Agresti & Finley, 2009). To answer our second research question about how students' preferences for textbook features relate to e-textbook use, *t*-tests and Cohen's *d* effect sizes were used to compare the importance of various textbook format features between students who prefer a print textbook to students who prefer an e-textbook. To answer our third research question about how students' learning with e-textbooks relates to their use of various interactive features, we first collapsed students' use of features into "Frequently" (very much or quite a bit of use) and "Infrequently" (some or very little use) and then we

used *t*-tests and Cohen's *d* effect sizes to compare students' *E-Text Learning* score by frequent use of different features.

Results

How does e-textbook use vary by student demographics and institution characteristics?

By Student Characteristics. First-year students are more likely to use e-textbooks than seniors. Students majoring in Biological Sciences, Physical Sciences, Business, and Engineering are more likely to use e-textbooks. Students majoring in Arts & Humanities, Social Sciences, Communications, Education, Health Professions, and Social Service Professions were less likely to use e-textbooks. Transfer students and students enrolled part-time are less likely to use e-textbooks. Students living on campus and students taking some of their courses online are more likely to use e-textbooks. Men are more likely to use e-textbooks, women less. Younger students (19 or younger) were more likely to use e-textbooks, older students less. International students, Asian, and Hispanic or Latino students are more likely to use e-textbooks; Black or African American and White students are less likely to use e-textbooks. More details about these differences in representation can be found in Table 3. No differences were found in e-textbook use by students' educational aspirations, fraternity or sorority members, athlete status, veteran status, disability status, or sexual orientation.

By Institution Characteristics. Students enrolled at doctoral-granting (highest and higher research activity) and master's-granting (medium programs) institutions were more likely to use e-textbooks. Students enrolled at master's granting (small programs) and baccalaureate-granting (Arts & Sciences and diverse programs) institutions were less likely to use e-textbooks. Students at publicly controlled institutions were more likely to use e-textbooks than students enrolled at privately controlled institutions. Students enrolled at larger institutions were more likely to use e-textbooks than students enrolled at smaller institutions. Finally, students enrolled at institutions located in the New England, Southwest, and Rocky Mountains regions of the United States were more likely to use e-textbooks while

students enrolled at institutions located in the Great Lakes and Southeast regions of the United States were less likely to use e-textbooks.

How are students' preferences for textbook features related to e-textbook use?

The largest difference for students' preferences was a stronger preference for e-textbook users to be able to use a keyword search ($p < .001$, $d = .76$). Much smaller differences were found for e-textbook users' preference based on instructor highlights and annotations ($p < .001$, $d = .29$), cost ($p < .001$, $d = .23$), offline access ($p < 001$, $d = .21$), and a trivial difference based on first-day availability ($p < .05$, $d = .05$). Print textbook users found it more important to be able to sell back the textbook after the course is over ($p < .001$, $d = .16$) and the ability to add highlights and notes ($p < .05$, $d = .07$) but the magnitudes of these differences were small. No differences were found in the ability to keep the textbook after the course is over between students who prefer e-textbooks and those that prefer print textbooks.

How does students' learning with e-textbooks relate to the use of various interactive features?

Overall students who more frequently used the interactive features of e-textbooks felt that their use of e-textbooks contributed to their learning and coursework completion. The largest differences were for students who more frequently interacted with other students ($p < .001$, $d = .98$), sent instructors questions ($p < .001$, $d = .94$), and took notes with their e-textbooks ($p < .001$, $d = .89$). Students who more frequently used their e-textbooks for bookmarking ($p < .001$, $d = .77$), accessed online resources via hyperlink ($p < .001$, $d = .76$), and highlighting ($p < .001$, $d = .73$) moderately felt a stronger sense that their e-textbook experience contributed to their learning. Even the smaller relationships between learning and e-textbook use were notable: downloading or printing ($p < .001$, $d = .67$), self-assessment ($p < .001$, $d = .64$), and keyword searching ($p < .001$, $d = .50$).

Limitations

Institutions self-select to participate in NSSE administrations and although NSSE participating institutions generally mirror the diversity of institutions in the United States (NSSE, 2018a), only a small subset of institutions were used in this study. Institutions were randomly selected to receive the extra item set about e-textbooks from the pool of institutions that had not already chosen two of NSSE's standard extra item sets. Institutions had the opportunity to decline participation in this optional set, potentially limiting our sample to institutions with some interest in student use of e-textbooks. Although these limitations may affect the generalizability of results and interpretations of these results outside of this context should be done with some caution, the large number of institutions and students included do give strength to our findings.

Discussion

These preliminary results present several interesting avenues for understanding student engagement within the context of e-textbooks as a mediating technology. The general division of students with more standard higher education experiences (i.e., living on campus with some online classes vs. entirely online education and/or full-time vs. part-time enrollment status) suggests possible expectations or types of interaction and development of reading behaviors within a more traditional higher education environment as opposed to the potentially more flexible online course schedules. That is, weekly meeting times may orient students to perceive their accountability as participants within these courses as requiring consistent, sustained reading, though these conceptions of accountability are also a function of numerous factors relating to the correspondence of the conceptions of knowing and learning embedded within pedagogical and curricular designs and students motivation and participation. Similarly, students facing other pressures from other communities with which they engage (e.g., work) may also not be able to meet some of the demands of their participation within particular higher education contexts. Differences in these experiences and the extent to which participation in different

communities likely relates to what students understand as reasonable and possible applications of their time and resources. These findings suggest the need to investigate these aspects in more detailed and nuanced ways through which students navigate and thus engage in their educational practices.

The divisions between sciences, engineering, business and more social sciences may be indicative of reliance and expectations of e-textbooks as more productive alternatives for encouraging engagement with larger class populations. Related to this finding is the degree of effect observed with those students who used their institution's e-textbook platforms to interact with other students and their instructors. Such findings indicate support and allocation of resources for e-textbooks by individuals within their institutions that may positively influence the overall outcome and experience of students across institutions. Further, the collaborative functions of these textbooks also suggest the need for expanded investigations in terms of the extent to which e-textbooks support collaborative engagement and participation within a particular course context. Both of these findings suggest the need to investigate more social elements in students' adoptions and engagement within and across various communities and course contexts. Specifically, conceptualizing engagement with e-textbooks and likely other computer mediated environments will likely require detailed understanding of the interactions of social and communal circumstances of learners in addition to the social disciplinary practices of the courses in which e-textbooks are used.

It is also interesting that the most pronounced difference observed in preference for e-textbook features was use of an interactive search feature. Given the general notions of engagement as allocation of time and resources students commit to and institutions provide for their learning, the use of a potentially time-saving resource such as interactive searching may suggest a more nuanced understanding of interaction with e-textbooks across institutions that use e-textbooks. Further, the association of adoption and interaction with the dynamic features of e-textbooks with student-

perceived performance provides a positive indicator of engagement understood as commitment of resources and activity for learning outcomes.

While it must be noted that this study is preliminary and limited in scope to broader institutional leanings, there is reason to support that the interactive use of e-textbooks within higher educational contexts may provide lasting positive benefits. Most notably, the comparison of perceived levels of interaction and outcomes with actual data from the e-textbook platforms is needed. Such findings may allow for a more sophisticated understanding of engagement within the context of e-textbooks. This suggests the need for fostering inter-institutional efforts in developing shared tools and resources for the analysis of e-textbook adoption and use, specifically, and technology use more generally.

Future research

Although this study looks at students' perceived use and preference for e-textbook features, much about their use remains unknown. As newer generations of students become more familiar with increasingly advanced forms of technology, students' preferences and needs are likely to continue evolving. Future research should continue to monitor the preferences and uses of e-textbook technology to better understand and make use of this changing resource. Ultimately, e-textbooks are intended to make learning more accessible and engaging and future studies should verify this relationship. Examining student use of e-textbooks and their interactive features in relation to student learning and development can further help us to understand how students' best construct knowledge and what tools and resources can best support this active construction. In addition to student use and perceptions, future investigations should also understand faculty and administrator perceptions of e-textbooks. As a pedagogical tool, faculty may need additional training and support in teaching with e-textbooks in order to assist students in using them to their best ability.

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Table 1. Additional NSSE Item Set: E-Textbooks

1. **An electronic textbook (e-textbook) is defined as a digital textbook with interactive features such as search, hyperlink, annotations, and highlights. During the current academic term, in how many courses have you used an electronic textbook?**
   Response options: None, One, Two or more courses
   [If students select "None,"' they do not receive items #3-#8. If students select "One" or "Two or more courses," they do not receive #2.]

2. **Why have you not used an e-textbook in the current academic term?**
   Response options: None of your courses required a textbook; Your courses had textbooks, but none of them were available as e-textbooks; E-textbooks were available, but you prefer print textbook

3. **About how many of your e-textbooks were available on the first day of your courses?**
   Response options: All, Most, Some, None, I don't know

4. **Which device have you typically used to read your e-textbooks?**
   Response options: Desktop computer, Laptop computer, Tablet, Smartphone, E-reader (e.g., Kindle)

5. **About how often have your instructors provided highlights and annotations in your e-textbooks?**
   Response options: Very often, Often, Sometimes, Never

6. **About how often have you used the following interactive features of e-textbooks?**
   Response options: Very often, Often, Sometimes, Never, Feature not available
   a. Keyword search
   b. Bookmarking
   c. Highlighting
   d. Note-taking
   e. Interacting with other students
   f. Sending the instructor a question
   g. Downloading or printing
   h. Accessing online resources via hyperlink
   i. Self-assessment (study questions, built-in quizzes, etc.)

7. **How would you evaluate your e-textbooks regarding the following?**
   Response options: Excellent, Good, Fair, Poor, Not applicable
   a. Ease of use
   b. Interactive features (e.g., highlighting, note-taking)
   c. Ability to interact with students
   d. Ability to interact with instructor
   e. Cost

8. **How much has your use of e-textbooks contributed to the following?**
   Response options: Very much, Quite a bit, Some, Very little
   a. Your understanding of course material
   b. Studying or completing coursework on your own
   c. Studying or completing coursework with other students

9. **If given the option, which textbook format would you prefer in the future?**
   Response options: Print textbook, E-textbook, No preference

10. **How important are the following to your preferred textbook format?**
    Response options: Very important, Important, Somewhat important, Not important
    a. Cost
    b. First-day availability
    c. Ability to add highlights and notes
    d. Ability to keep after the course is over
    e. Ability to sell back after the course is over
    f. Keyword search
    g. Instructor highlights and annotations
    h. Offline access

Table 2. Select Respondent Demographics and Characteristics by Class Standing

		First-year (%)	Senior (%)	Total (%)
Major field	Arts & Humanities	7.3	8.1	7.8
	Bio Sciences, Agric, & Natural Resources	13.1	10.6	11.6
	Phys Sciences, Math, & Computer Science	7.7	6.0	6.7
	Social Sciences	10.5	11.5	11.1
	Business	14.8	19.2	17.3
	Comm, Media, & Public Relations	3.6	3.7	3.7
	Education	8.7	8.2	8.4
	Engineering	6.1	7.5	6.9
	Health Professions	16.9	13.5	15.0
	Social Service Professions	4.4	5.1	4.8
	All Other	3.4	6.5	5.2
Grades	Mostly A grades	48.3	51.3	50.1
	Mostly B grades	42.0	42.4	42.2
	Mostly C grades or lower	9.6	6.3	7.7
Transfer student		7.5%	45.0	29.3
Educational aspirations	Some college/university	6.8	6.8	6.8
	Bachelor's degree	33.4	30.7	31.8
	Master's degree	35.7	40.1	38.3
	Doctoral or professional degree	24.1	22.3	23.1
Living on campus		73.2%	21.0	42.9
Enrolled full-time		95.8%	84.5	89.2
Course format	No courses taken online	74.2	62.3	67.3
	Some courses taken online	23.7	28.6	26.5
	All courses taken online	2.1	9.1	6.2
First-generation		41.9%	46.0	44.3
Gender identity	Man	32.2	35.8	34.3
	Woman	65.2	61.7	63.2
	Another gender identity	1.3	1.2	1.2
	I prefer not to respond	1.3	1.4	1.3
Age	19 or younger	89.3	0.6	37.8
	20-23	6.2	65.6	40.7
	24-29	1.7	15.4	9.7
	Over 30	2.8	18.4	11.8
International student		4.2%	2.9	3.5
Racial/Ethnic background	American Indian or Alaska Native	0.5	0.5	0.5
	Asian	6.1	5.3	5.7
	Black or African American	11.9	10.3	10.9
	Hispanic or Latino	5.0	5.1	5.1
	Native Hawaiian or Other Pacific Islander	0.2	0.3	0.3
	White	65.2	68.3	67.0
	Other	1.2	1.0	1.1
	Multiracial	7.2	5.6	6.2
	I prefer not to respond	2.7	3.7	3.3
Disability status	Yes	12.4	13.7	13.2
	No disability or impairment	83.6	82.8	83.1
	I prefer not to respond	4.0	3.5	3.7
Sexual orientation	Straight (heterosexual)	82.9	85.1	84.2
	LGBQ+	13.3	10.8	11.8
	I prefer not to respond	3.8	4.2	4.0

Table 3. Chi-Square Statistics for Representation of Student Demographics and Characteristics by E-textbook Use

	Adjusted residual		
	No e-textbook use	E-textbook user	
First-year	-6.1	6.1	χ^2= 37.613, p < .001
Senior	6.1	-6.1	n = 10320, df = 1
Arts & Humanities	6.8	-6.8	χ^2= 262.186, p < .001
Bio Sciences, Agric, & Natural Resources	-2.5	2.5	n = 10262, df = 11
Phys Sciences, Math, & Computer Science	-4.7	4.7	
Social Sciences	2.6	-2.6	
Business	-12.0	12.0	
Comm, Media, & Public Relations	2.0	-2.0	
Education	3.6	-3.6	
Engineering	-2.3	2.3	
Health Professions	5.2	-5.2	
Social Service Professions	5.0	-5.0	
All Other	0.8	-0.8	
Non-transfer student	-2.2	2.2	χ^2= 5.052, p < .01
Transfer student	2.2	-2.2	n = 10277, df = 1
Student not living on campus	4.0	-4.0	χ^2= 16.154, p < .001
Student living on campus	-3.6	3.6	n = 10219, df = 2
Student is homeless or in transition	-1.2	1.2	
Part-time enrolled	5.3	-5.3	χ^2= 27.970, p < .001
Full-time enrolled	-5.3	5.3	n = 10320, df = 1
No courses taken online	7.6	-7.6	χ^2= 60.965, p < .001
Some courses taken online	-7.5	7.5	n = 10258, df = 2
All courses taken online	-1.0	1.0	
Not first-generation	-2.7	2.7	χ^2= 7.408, p < .01
First-generation	2.7	-2.7	n = 10239, df = 1
Man	-5.6	5.6	χ^2= 31.277, p < .001
Woman	5.3	-5.3	n = 10285, df = 3
Another gender identity	0.2	-0.2	
I prefer not to respond	0.8	-0.8	
19 or younger	-6.4	6.4	χ^2= 60.674, p < .001
20-23	3.4	-3.4	n = 10178, df = 5
24-29	-0.6	0.6	
30-39	2.9	-2.9	
40-55	2.8	-2.8	
Over 55	3.6	-3.6	
Not an international student	2.6	-2.6	χ^2= 6.514, p < .05
International student	-2.6	2.6	n = 10247, df = 1
American Indian or Alaska Native	1.0	-1.0	χ^2= 54.256, p < .001
Asian	-6.2	6.2	n = 10236, df = 8
Black or African American	2.1	-2.1	
Hispanic or Latino	-2.6	2.6	
Native Hawaiian or Other Pacific Islander	-0.6	0.6	
White	3.4	-3.4	
Other	-1.5	1.5	
Multiracial	-0.4	0.4	
I prefer not to respond	-0.1	0.1	

Note that only results with a statistically significant χ^2 (p < .05) are included in this table.

Table 4. Chi-Square Statistics for Representation of Institution Characteristics by E-textbook Use

	Adjusted residual		
	No e-textbook use	E-textbook user	
Doctoral-granting highest research	-8.0	8.0	χ^2= 147.973, p < .001
Doctoral-granting higher research	-5.2	5.2	n = 10320, df = 6
Master's-granting large programs	1.9	-1.9	
Master's-granting medium programs	-2.7	2.7	
Master's-granting small programs	2.8	-2.8	
Baccalaureate-granting Arts & Sciences	7.1	-7.1	
Baccalaureate-granting diverse fields	3.1	-3.1	
Public control	-5.3	5.3	χ^2= 28.018, p < .001
Private control	5.3	-5.3	n = 10320, df = 1
Very small (fewer than 1,000)	5.3	-5.3	χ^2= 92.392, p < .001
Small (1,000-2,499)	6.8	-6.8	n =9888, df = 4
Medium (2,500-4,999)	0.0	0.0	
Large (5,000-9,999)	-4.1	4.1	
Very large (10,000 or more)	-5.0	5.0	
New England	-2.4	2.4	χ^2= 95.033, p < .001
Mid-East	0.6	-0.6	n =10320, df = 7
Great Lakes	5.4	-5.4	
Plains	0.7	-0.7	
Southeast	3.7	-3.7	
Southwest	-5.4	5.4	
Rocky Mountains	-5.2	5.2	
Far West	1.9	-1.9	